

IN THE CLAIMS

Please amend the claims as follows:

- 1 1. (Withdrawn) A method of p-type doping in ZnO comprising:  
2 forming an acceptor-doped material having ZnO under reducing conditions,  
3 thereby insuring a high donor density; and  
4 annealing the specimens of said acceptor-doped material at intermediate  
5 temperatures under oxidizing conditions so as to remove intrinsic donors and activate  
6 impurity acceptors.
- 1 2. (Withdrawn) The method of claim 1, wherein said reducing conditions comprise a  
2 hydrogen containing atmosphere.
- 1 3. (Withdrawn) The method of claim 1, wherein said reducing conditions comprise a  
2 non- hydrogen containing atmosphere.
- 1 4. (Withdrawn) The method of claim 1, wherein said acceptor-doped material comprises  
2 a substrate, a n-type ZnO layer deposited on said substrate, and a p-type layer deposited  
3 on said n-type ZnO layer.
- 1 5. (Withdrawn) The method of claim 1, wherein said intermediate temperatures  
2 comprise a temperature range between 200 °C and 700 °C.
- 1 6. (Withdrawn) A method of forming p-n junctions using p-type ZnO comprising:  
2 forming an acceptor-doped material having ZnO under reducing conditions,  
3 thereby insuring a high donor density; and

4        annealing the specimens of said acceptor-doped material at intermediate  
5        temperatures under oxidizing conditions so as to remove intrinsic donors and activate  
6        impurity acceptors.

1        7. (Withdrawn) The method of claim 6, wherein said reducing conditions comprise a  
2        hydrogen containing atmosphere.

1        8. (Withdrawn) The method of claim 6, wherein said reducing conditions comprise a  
2        non- hydrogen containing atmosphere.

1        9. (Withdrawn) The method of claim 6, wherein said acceptor-doped material comprises  
2        a substrate, a n-type ZnO layer deposited on said substrate, and a p-type layer deposited  
3        on said n-type ZnO layer.

1        10. (Withdrawn) The method of claim 6, wherein said intermediate temperatures  
2        comprises a temperature range between 200 °C and 700 °C.

1        11. (Currently Amended) A wide band gap semiconductor device comprising:  
2        -a substrate;  
3        a n-type ZnO layer formed on said substrate; and  
4        a p-type ZnO layer formed on said n-type ZnO layer;  
5        wherein said n-type ZnO layer and said p-type ZnO layer are annealed in air to  
6        activate p-type conductivity

7        ~~an acceptor doped material having ZnO that is formed under reducing conditions, thereby~~  
8        ~~insuring a high donor density; wherein the specimens of said acceptor doped material are~~

9 ~~annealed at intermediate temperatures under oxidizing conditions so as to remove~~  
10 ~~intrinsic donors and activate impurity acceptors.~~

1 12. (Currently Amended) The wide band gap semiconductor device of claim 11,  
2 wherein said p-type ZnO layer is produced said in reducing conditions ~~comprise~~  
3 comprising a hydrogen containing atmosphere.

1 13. (Original) The wide band gap semiconductor device of claim 11, wherein said p-  
2 type ZnO layer is produced said in reducing conditions ~~comprise comprising~~ a non-  
3 hydrogen containing atmosphere.

1 14. Canceled.

1 15. (Currently Amended) The wide band gap semiconductor device of claim 11,  
2 wherein said n-type ZnO layer and said p-type ZnO layer are annealed intermediate  
3 ~~temperatures comprise a temperature range between 200 °C and 700 °C.~~

1 16. (Currently Amended) A p-n junction comprising:  
2 a substrate;  
3 a n-type ZnO layer formed on said substrate; and  
4 a p-type ZnO layer formed on said n-type ZnO layer;  
5 wherein said n-type ZnO layer and said p-type ZnO layer are annealed in air to  
6 activate p-type conductivity ~~an acceptor doped material having ZnO that is formed under~~  
7 ~~reducing conditions, thereby insuring a high donor density; wherein the specimens of said~~  
8 ~~acceptor doped material are annealed at intermediate temperatures under oxidizing~~  
9 ~~conditions so as to remove intrinsic donors and activate impurity acceptors.~~

1 17. (Currently Amended) The p-n junction of claim 16, said p-type ZnO layer is  
2 produced in reducing conditions comprising a hydrogen containing atmosphere wherein  
3 ~~said reducing conditions comprise a hydrogen containing atmosphere.~~

1 18. (Currently Amended) The p-n junction of claim 16, wherein said p-type ZnO layer is  
2 produced in reducing conditions comprising a non- hydrogen containing atmosphere  
3 ~~wherein said reducing conditions comprise a non- hydrogen containing atmosphere.~~

1 19. (Original) The p-n junction of claim 16, wherein said acceptor-doped material  
2 comprises a substrate, a n-type ZnO layer deposited on said substrate, and a p-type layer  
3 deposited on said n-type ZnO layer.

1 20. (Currently Amended) The p-n junction of claim 16, said n-type ZnO layer and said p-  
2 type ZnO layer are annealed between 200 °C and 700 °C wherein said intermediate  
3 ~~temperatures comprises a temperature range between 200°C and 700°C.~~